APPENDIX A.

Convective Movement of Uranium to the Earth's Surface.—The estimate of temperature given assumes (1) that the mass of igneous material is spherical, and (2) that its surface is kept at constant temperature, heat escaping freely. The first assumption is in favour of increasing the estimate of temperature, and probably would not generally be true, especially of a mass moving upwards. The second assumption tends to give a lower estimate of temperature, and is certainly misleading, as the surrounding materials are non-conducting, and must favour the accumulation of radio-active heat.

On assumptions (1) and (2) and on Barus' results for the thermal expansion of diabase between 1100° and 1500°,[1] and results of my own on basalt,[2] which are in approximate agreement, and assuming the mean excess of temperature to be 500° and the surrounding material to be at a fluid temperature, the force of buoyancy comes out at more than 60 dynes per cubic centimetre of the spherical mass. This is an under-estimate.

If we may assume that the Deccan Trap is indeed an instance of such an over-heated mass escaping at the surface, and that similar radio-active masses rising up from beneath at various times in the past may have affected the crust, we have at our disposal a local source of energy of plutonic origin which may account for much.

APPENDIX B.

Sedimentation and Rise of Geotherms.—The depth of the upper radio-active layer is, of course, unknown. We possess, however, the means of arriving at some idea of what it must be. The quantitative thermal conditions impose a major limit to its average thickness, and the indications of injected rocks suggest a minor limit.

It will be found that if $2{\cdot}6\times10^{20}$ calories is the heat output of the whole earth per annum, and if we assign only one-fifth of this amount to cooling due to decay of the uranium, then, on the assumption that the earth is no longer losing any part of its original store of heat, we have about 2×10^{20} representing radium heating. From this the allowance of terrestrial radium per square centimetre inwards is $2{\cdot}3\times10^{-5}$ grams. This would give a major limit. But it is almost certain that some of this radium is located in more deeply seated parts of the earth. If we take 10^{-5} as contained in the normal radio-active surface layer, and assume (what according to my experiments should not be far from the truth) that the average radio-activity is 3, we arrive at a thickness of 12 kilometres.

Some such mean value is necessitated by the evidence we derive from the radio-activity of igneous rocks. These rocks must in many cases be derived from considerable depths. Such outflows as the Deccan may indicate local sub-crustal conditions; so also may the eruptions of certain volcanic areas. But those extrusions which have attended mountain building, more especially its closing phases, appear to indicate general conditions, and involve the existence of such radio-active materials at considerable depths. If we assume a thickness for the radio-active part of the crust much less than the 12 kilometres, difficulties are met with on this line of reasoning.[3]

Proceeding now to the derivation of the results given in the table, p. 464. The equation $k\theta=qhx(D-x/2)$ (where θ is the temperature at the depth x, D being the total depth of the radio-active layer, q the radium per c.c. in grams, h the heat output of one gram of radium per second, k the thermal conductivity) is easily derived by considering the conditions of thermal flow in the layer, supposed to lose heat only at the surface.[4]

The aggregate depths of radio-active material in the several cases of sedimentary deposit assumed in my address amount to 18, 20, 22, 24, and 26 kilometres. I assume the mean radio-activity to be 3·5, and the average conductivity to be 4×10^{-3}. From this the basal temperatures are found, as due to radio-thermal actions. These temperatures are to be augmented by the temperatures proper to the several depths, which depend upon the conducted interior heat. To estimate these we require to apportion the observed average surface gradient (taken as 32 metres per degree) between radio-active effects in the upper layer and the flow of heat from within. The radio-thermal gradient comes out at about 75 metres; the inner gradient is accordingly 56 metres. Hence the total temperature at the base of each radio-active mass is obtained. But the geotherms proper to the several depths, 18, 20, &c., kilometres, under conditions prevailing elsewhere in the crust, are easily found from the value of θ for the normal layer (82° C.), and adding the temperature due to interior heat. From the difference of the temperatures we, finally, find the rise of the geotherms.

As conveyed in my address, I have found on several different values of the thickness and radio-active properties of the surface layer, results in every case showing large values for the rise of the geotherms. The data assumed above are by no means the most favourable.

---

[1] Phil. Mag., xxxv., p. 173.

[2] Trans. R.D.S., vi., p. 208.

[3] See p. 464, *ante*, and foot-note as bearing on the possible displacement of the geotherms.

[4] See Strutt, Proc. R S., lxxvii., p 482.

NOTES.

IT is with deep regret that we learn of the sudden death of Prof. Alexis Hansky, whose work in solar physics at the Pulkowa Observatory has attracted so much attention. According to a letter from M. Tikhoff, which appears in the September number of the *Bulletin de la Société astronomique de France*, M. Hansky was drowned whilst bathing in the Black Sea at Simeise, in the Crimea, on August 11 (July 29 O.S.). The deceased astronomer commenced his practical work in solar physics by observing the total eclipse of 1896 at Novaya Zemlya, and at the time of his tragic death was engaged in the installation of a new observatory in the Crimea which had been given to him, and which he had handed over to the Pulkowa Observatory. By his death at the early age of thirty-six years, the study of solar physics has suffered a loss which it will be exceedingly difficult to repair.

THE President of the Local Government Board has arranged for the making of the two following researches:—a chemical and bacteriological investigation, by Mr. C. G. Moor and Prof. R. T. Hewlett, as to the influence of softening and of other chemical processes on the purity of water supplies from the chalk as shown in actual experience and under experimental conditions, and an investigation by Prof. Sidney Martin, F.R.S., into the powers of production of disease possessed by certain streptococci and by the poisonous substances produced by them, in continuance of previous investigations by him on the same subject. These investigations complete the allocation of the scientific grant for the year 1908–9.

PROF. ROBERT KOCH has been chosen to represent the German Government at the forthcoming International Tuberculosis Congress at Washington.

THE annual conference of the Sanitary Inspectors' Association opened on Tuesday last under the presidency of Sir James Crichton-Browne, F.R.S.

THE third International Philosophy Congress has been in session at Heidelberg during a portion of the past week. The next meeting will take place in 1912, at Bologna.

THE arrangements for the fourth International Fisheries Congress, which, as has already been announced, is to be held at Washington from September 22–26, are now complete. An attractive itinerary has been arranged for the week following the sessions of the congress, and includes visits to New York City, Narragansett Bay, Wood's Hole, Boston, and Gloucester, at each of which places local committees and individual residents will provide demonstrations of fishery methods and incidental entertainment. The methods of oyster culture employed on the great New England beds, the pound-net fishery, the purse-seine fishery, inspection of fish markets and vessels, the methods of deep-sea research, and other matters relating to the fisheries will be shown. Special itineraries will be arranged for members who may desire to visit other fisheries and hatcheries, and letters of introduction will be furnished.

AN International Rubber Exhibition (lasting a fortnight) is to be held at Olympia, London, from September 14. The exhibits will consist wholly of objects of interest to members of the rubber and allied trades, and will comprise illustrations of the growth of the commodity and examples of the machinery employed in its manipulation. Rubber trees in all stages of their growth will be shown, together with the raw material obtained from them, and the varied forms into which it is manufactured. Demonstrations will be given in a laboratory, and growers, manufacturers, and others will have an opportunity of discussing questions relating to the industry at an international congress, to which delegates have been sent by many Continental countries. Borneo, Mexico, and other rubber-producing countries are taking part in the enterprise.

AT the third International Congress of the History of Religions, which is to be held on September 15–18 at Oxford under the presidency of Sir Alfred Lyall (Prof. E. B. Tylor, F.R.S., being honorary president), the following papers will be communicated to general meetings of the congress:—the address of the president; religious wisdom cultivated in old Israel in common with neighbouring peoples, by Prof. von Orelli; l'Influence religieuse de l'Astrologie dans le Monde Romain, by Prof. Cumont; Buddhistic religious art, by Prof. Macdonell; some ethical developments of pre-Christian Judaism, by Dr. Charles; totemism, by Dr. F. Boaz; and the Cretan religions, by Dr. Arthur Evans, F.R.S.

AMONG the papers to be read at the International Congress of the Refrigerating Industries (which, as has already been stated in these columns, is to take place in Paris on October 5–12 next) we notice the following:—the effects of low temperature, by Sir W. Ramsay, K.C.B., F.R.S.; liquid air, by Dr. L. A. Groth; the construction of cold stores, by Mr. Hal Williams; notes on methods and apparatus for ascertaining the heat, conductivity, and insulating properties of materials, by Mr. W. D. A. Bost; the refrigeration of, and transport of refrigerated, fruit, &c., Mr. C. M. Simons, Mr. F. W. J. Moore, and Mr. H. J. Ward; ice-making and ice-machinery, by Mr. T. F. Mead; new industrial applications of cold, by Mr. H. Birkett; the organisation of cold-storage transport on railways—refrigerator-cars, cold-storage warehouses, and charges, by Mr. T. N. Wylie; and the organisation of cold-storage transport by sea, by Mr. J. T. Milton.

A SOMEWHAT severe earthquake shock is reported to have been felt at Shemakha (Transcaucasia) at 8 o'clock in the evening of September 1. The direction was from south to north.

A MONUMENT to Hermann von Wissmann, the German African explorer, was unveiled at Lauterberg, in the Harz, on Friday last.

MR. F. J. SEAVER, assistant botanist of the North Dakota Agricultural College, has been appointed director of laboratories in the New York Botanical Garden.

DR. K. WEGENER has, according to *Science*, been appointed director of the Observatory of Samoa.

THE new building of the medical college of Western Reserve University (which will be devoted to experimental medicine) is to be dedicated on November 20, when an address will be delivered by Dr. W. H. Welch, of the Johns Hopkins Medical School.

THE College of Physicians, Philadelphia, has awarded the Alvarenga prize for 1908 to Dr. William T. Shoemaker, for his essay on "Retinitis Pigmentosa."

THE fourth field meeting (to Bisley) of the Cotteswold Naturalists' Field Club will be held on Tuesday next, when those attending will drive from Stroud to the Frith Quarry and Worgan's Quarry to study the richly fossiliferous Inferior-Oolite strata there exposed.

ARRANGEMENTS are being made for the holding of fungus forays under the auspices of the South-Eastern Union of Scientific Societies in the neighbourhood of Tunbridge Wells on October 9 and 10. Full particulars respecting the same may be obtained from the honorary secretary of the cryptogamic section, Dr. George Abbott, 4 Rusthall Park, Tunbridge Wells.

DURING the past week there has been much activity in France in the interests of aërial navigation. On September 5 the military dirigible balloon, the *République*, made the longest flight so far achieved by her. Leaving her headquarters at Chalais-Meudon at 8.40, she crossed Paris, and proceeded by way of Senlis and Pont St. Maxence to Compiègne, which was reached at 12.30. Circling here, without stopping she returned to Paris by a slightly more eastern route, and was back at Chalais-Meudon by 3.10. The journey, which thus lasted six hours and a half, is estimated at between 180 and 200 kilometres. The balloon attained a height of 650 metres, and of the 420 kilograms of ballast with which she started, 190 kilograms remained at the end of the journey. At Le Mans, Mr. Wilbur Wright made at 7.30 in the morning a flight of 19m. 48 2-5s., which is within a few seconds of the "world's record" of Mr. Farman, namely, 20m. 9 3-5s. The distance covered is estimated at 22 kilometres. In attempting a second flight, which lasted 3m. 21s., at a height of 12 to 15 metres, a violent gust of wind drove the aëroplane so near the trees on the edge of the ground that a sudden turn had to be made, in the accomplishment of which the end of the left wing came in contact with the earth and was broken. On September 6 M. Delagrange made a flight lasting 29m. 53 4-5s., and covered a distance of 24 kilometres 727 metres. He was compelled to alight from want of fuel, having started with only 24 litres. This flight constitutes a new "world's record," both for time and distance.

ACCORDING to the *Pharmaceutical Journal*, an important step is being taken by the Commonwealth Government in regard to the adoption of uniform food standards throughout Australia. Under the present system each State fixes its own standards, the result being considerable variance, and consequent annoyance and expense to manufacturers and importers. Now that a Commonwealth analyst has been appointed, the way is cleared for federal action, and the proposal is made for a conference of Commonwealth and State expert authorities with the object of discussing the basis of united legislation.

IT is stated in the *Lancet* that out of 50,000 pupils in the primary schools of Milan 47,000 are more or less the victims of buccal maladies, mainly affecting the teeth, and steps are being taken to bring about a more satisfactory condition of things. To this end the Associazione per la Scuola, composed of representatives of the family and of the teaching profession, the Istituto Stomatologico Italiano, and the municipality, are acting in concert to make a periodical inspection of the primary schools, beginning with the coming scholastic year 1908–9. This inspection is to be carried out by the "Commissione d'Igiene," presided over by Dr. Ambrogio Bertarelli, and composed of Dr. Bordoni-Uffreduzzi, Dr. Clerici, and other eminent consultants and practitioners of the Lombard school. Under the auspices of this commission the inspection will be performed by the specialists attached to the Istituto Stomatologico, who will communicate to the parents or guardians of the children concerned the stomatological condition of each, illustrated with appropriate diagrams. A small fee will be expected from the well-to-do families of the children inspected, while the service will be rendered gratuitously to those of humble means. At the end of the year statistical tables of the cures effected and of the results obtained will be presented to the municipality.

OUTBREAKS of American gooseberry mildew having occurred in various parts of Essex, and the matter having been brought under the notice of a committee of the Essex County Council, the county inspectors have been authorised to enter premises where the disease is believed to exist with the view of specimens being sent to the county laboratories to be reported upon.

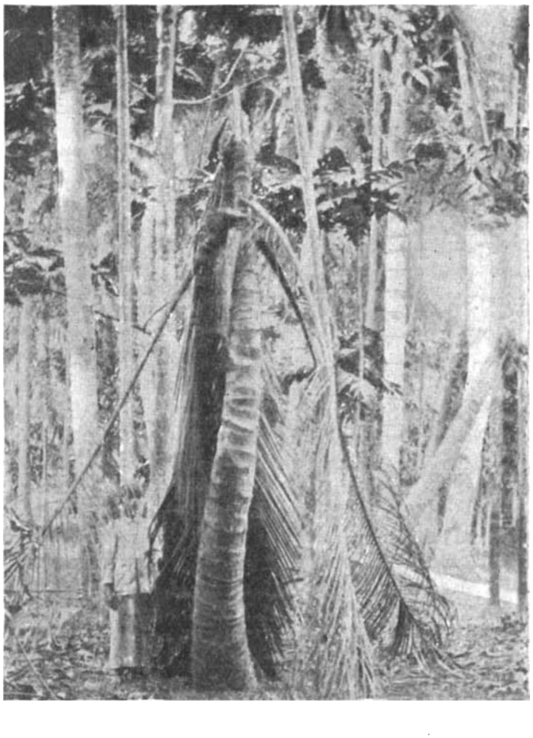
SILVER medals are this year offered by the Industrial Society of Mulhouse for the synthesis of a gum possessing the properties of Senegal gum, and for a handbook treating of the drugs used in the dyeing and printing industries; a medal of honour is offered for an economical substitute for dried egg-albumen, or for a decolourised blood-albumen for the same purpose. Other awards will be given for papers on the colouring matter or on the carmine in cochineal; the theory and manufacture of alizarin reds; the composition of aniline black; the transformation of cotton into oxycellulose; the composition of colouring matter and synthesis of a natural colour, various mordants, bleaching processes, and colours, &c. Papers, &c., must reach the Président de la Société Industrielle de Mulhouse, Alsace-Lorraine, before February 15, 1909. Further details may be obtained on application.

A CANAL of the width of rather more than 1000 feet is to be constructed through the island of Mühlenwerder, in the Elbe, where the Mühlenfeut joins the river, by which Hamburg will be enabled to use a considerable part of the island for future harbour construction, and to leave the waterway from the mouth of the Elbe to Harburg independent of Hamburg's shipping. Hamburg will in consequence be able to construct harbour basins independent of the part of the Elbe belonging to Prussia. The deepening and widening of the lower portion of the Elbe in 1896 resulted in the river being available for the increasing traffic and the larger dimensions of the vessels, but the improvements then made are no longer sufficient; hence the present proposal, the cost of the carrying out of which is estimated at 6,000,000*l*.

THE April number (vol. ii., part i.) of the Records of the Indian Museum contains a notice of the retirement of Lieut.-Colonel Alcock from the office of superintendent of the museum. Colonel Alcock came to India in 1886 as a member of the Government Medical Service, and after two years' professional work on the N.W. frontier he was gazetted surgeon-naturalist to the Indian Marine Survey; his appointment to the superintendentship of the museum took place in 1893. A minute of the trustees records the value of his services to the museum and to biological science generally.

WE have to acknowledge the receipt of a copy of the report of the Indian Museum for 1906–7, wherein attention is directed to the embarrassment caused by the smallness of the staff when two or three of its members are absent on leave. It is, however, hoped that a revised scale of pay will attract a better class of men to the posts filled by the non-gazetted members of the staff. Much satisfaction will be felt at the addition to the staff of a natural-history collector, and at the permission granted to the superintendent to visit various parts of India for the prosecution of faunistic and bionomical researches.

THE ravages of the coffee disease are so fresh in the memories of the inhabitants of Ceylon that it is no wonder the appearance of the bleeding disease of the cocoa-nut trees caused considerable alarm in the colony. Fortunately, however, they are now better prepared to resist the attack of an epidemic caused by a parasitic fungus than they were twenty-five years ago. For one thing, they have a resident official mycologist who was able at once to tell them what steps to take to prevent the spread of the disease, and the growers were ready, if not eager, to take them. The illustration shows a young cocoa-nut tree destroyed by the disease (*Thielaviopsis ethaceticus*, Went.), The first appearance consists of a rusty or dusky bleeding patch on the stem, which is subsequently followed by



others. As soon as the crown or "cabbage" is affected the tree dies, as in the figure. A bleeding patch is seen just above the level of "podion's," or boy's, head, and there are two other smaller ones higher up. Young trees succumb much sooner than old ones. The remedy recommended by Mr. T. Petch consists in cutting out the diseased areas with a chisel, searing the cavities, and applying hot coal-tar.

EARWIGS are generally supposed to make but very occasional use of their complexly folded wings. In the August issue (vol. iii., No. 2) of the *Journal of Economic Biology* Mr. W. E. Collinge records, however, that on many evenings in June and July last a considerable number of these insects was observed on the wing, apparently in the neighbourhood of Berkhampstead. Individuals—all males—ranging in number from seven to eleven flew into a single lighted room on three evenings, thus indicating that many more must have been on the wing out-of-doors.

AN article treating of the cotton varieties in Egypt is contributed by Mr. W. L. Balls to the *Cairo Scientific Journal* (July). The author, discussing the mixed nature of the crop, attributes it not only to the number of varieties, but also to the developments arising out of interplanting and natural crossing. With regard to the origin of the Egyptian cottons, while it is possible to indicate the source of one or two, such as Abassi and Yannovitch, the source of most of the varieties is indeterminable. Also it is noted that unless the original strain is pure, there must be continual breaking away from the type. A scheme for improving the crop is foreshadowed in connection with an experiment station that is being founded by the Khedivial Agricultural Society. The plan consists in obtaining pure varieties by selection or crossing, and the maintenance of such pure varieties by special precautions.

THE current number of the *Kew Bulletin* (No. 7) opens with a short account, communicated by Mr. G. Massee, of the fungus *Naemospora crocea*, that causes "die-back" of peach shoots. The genus falls in the group of "fungi imperfecti," as only the conidial reproductive stage is known. Conidial infection is limited to shoots of the year's growth. Mr. A. L. Simmons, adding to the list of Lepidoptera taken in the gardens, records the discovery of pupæ of the spurge hawk-moth and the capture of a swallow-tail butterfly. There are also published analyses of the tuberous roots of the new Ecanda rubber plant *Raphionacme utilis*, and an article on the cultivation of the date-palm in Mesopotamia.

MR. P. S. SPARKMAN, an Englishman settled in San Diego County, California, devoted his life to the study of the Luiseno tribe of Indians, among whom he lived. Before his murder in May, 1907, he had completed a dictionary of the native dialect and an account of the culture of the tribe, the latter being now issued as a part of vol. viii. of the University of California memoirs on archæology and ethnology. The culture of the tribe presents no features of special interest, that of the neighbouring and allied tribes having been already illustrated in other issues of the same series. Their food largely consists of various kinds of acorns, for the crushing of which a stone mortar is required. This is formed by chipping in a rock a slight cavity, round which a basin-shaped basket is fixed with pitch to prevent the contents from flying out when struck by the pestle. With constant use this cavity becomes deeper and deeper, until the basket, being no longer necessary, is removed. The tribe supplies an excellent example of that curious institution, the Couvade. The father for some time after the birth of a child is obliged to take as much care of himself as the mother does. He must not take cold, lest the health of the infant might be endangered; he cannot drink cold water in winter; he must eat the same diet as that prescribed for the baby. If the child dies, its mother attributes her loss to his neglect of these precautions. We have also a full account of the initiation rites, and the writer has been lucky enough to procure a full record of the exhortation addressed by the person in charge of the rite, who carefully explains, with appropriate warnings, the rules of life and etiquette which the boys and girls are expected to obey. Morals, in fact, merely mean the observance of the long-established customs of the tribe, and do not include those higher rules of conduct which the codes of more advanced societies prescribe.

THROUGHOUT Africa are played games, usually between two players, which consist of transferring counters from one hole to another; formerly these have been classed by ethnologists under the Nubian name of *mangala, mankalah*, &c., but Captain R. Avelot (*Bull. Soc. d'Anth.*, Paris, 1908, p. 9) distinguishes three types, for which he adopts the names of *tshéla* for the games of skill, *tab* for games of the backgammon group, and *ouri* (*uri*) for games of mathematical combinations. The author mentions the distribution of the three types, and gives a map of the spread of hole games, more particularly of *uri*, as well as a list of the native names for these games. He concludes that *uri* may be considered as absolutely African, which appears to have arisen among a Hamitic tribe in the neighbourhood of Ethiopia, whence it has been spread (*a*) by the Fulah across south Sahara to Senegambia, and thence to Guinea and Gabon; (*b*) by Nubian slave-merchants, who took it down the Nile; (*c*) by the Jaggas, who, skirting the south of the equatorial forests, carried it to Angola; (*d*) by a Negro-Hamitic people it proceeded south as far as Manica. The hole games have nothing to do with cup-markings. Although the author in this and his earlier paper (*Bull.*, 1906, p. 267) gives numerous references, he has overlooked S. Culin's paper, "Mancala, the National Game of Africa," Report U.S. Nat. Mus. for 1894 (1896), p. 597, and Flinders Petrie's remarks in "Egyptian Tales," 2nd series, 1895, p. 136.

THE lake dwellers of Lower Dahomey, who have been studied by Major-Surgeon Gaillard (*l'Anthropologie*, xviii., p. 99), do not present many analogies with the inhabitants of aquatic pile-dwellings of Malaysia and New Guinea. In some cases the village in the water is opposite one of the same name on the land, and there is evidence in favour of the view that the natives were driven to build on the lake to escape the depredations of the Dahomians, who could not cross the water on account of the fetish customs. The lake-dwellers are not attached to their condition, and during the existing state of political security have returned to the ordinary agriculture of the district, though still remaining fisher-folk, and a great number have built ordinary land houses, but these are accused by those who remain faithful to the pile-dwellings of being incapable fishermen. Fishing grounds are free to all. The miserable condition of their houses is due to a lack of forethought and a passion for tobacco and alcohol.

THE Corps of Mining Engineers of Peru has issued a *Boletin* (No. 57), by Mr. E. A. L. de Romaña, on the tin deposits of Bolivia and prospecting for tin in Peru. Covering 100 pages, with twenty-eight illustrations, it is the most complete memoir on the subject, and is of special interest at the present time, when growing uneasiness prevails that many of the world's best tin deposits are becoming exhausted, and that the price of the metal may possibly become quite prohibitive for many industrial purposes before long. In Bolivia it is evident that the prospects are good. That country now ranks second only to the Federated Malay States as a tin-producing district, and it is probable that the production will continue to increase. Careful exploration has been made in Peru in the provinces of Huancané and Chucuito, which are the nearest to the Bolivian tinfields, but with the exception of some samples of stanniferous lead ore found at Vilque Chico, no indications of tin were discovered. Another *Boletin* (No. 56) issued by the Corps of Mining Engineers of Peru deals with the problem of the irrigation of the valley of Ica.

THE records of the Mysore Geological Department (vol. vii.), which have just been received, contain general and special reports of work done from July, 1905, to June, 1906. The year was an eventful one in the history of mining in Mysore owing to the attention devoted to the mineral resources by European and native capitalists. Chief among the ores sought were those of manganese and chromium. Other minerals which engaged attention were magnesite, asbestos, and chromium. The new goldfield near Lingadhalli gave good indications. The value of the gold raised in the Kolar area during the year was 2,274,786*l*. The results of the work of the Geological Survey during the year are given in special reports by Mr. H. Kelsall Slater and Mr. P. Sampat Iyengar. The former made a geological survey of 180 square miles in the Kadur district. The boundary of the granite extending from Tarikere westward was mapped, and found to conform generally with the base of the hills. The schists composing the hills are invariably associated with the occurrence of gold. Numerous old workings were discovered, and the area deserves careful prospecting, as it bids fair to prove another valuable goldfield. In the Mysore district the felsite and porphyry dykes of Seringapatam were mapped. In the Tumkur district traces of gold were found, and the native workings of grey corundum are described. Reports are also given on the geology of the Srinivaspur and Kadri Taluks, and of parts of Challakere and Sira Taluks. An appendix is devoted to a detailed description of important felsite and porphyry dykes in the neighbourhood of Seringapatam. When polished they yield very handsome ornamental and building stones.

IN his "Studies on the Thermodynamics of the Atmosphere," published under the auspices of the Weather Bureau, U.S. Department of Agriculture, Prof. F. H. Bigelow collects nine papers which he had contributed during 1906 to the *Monthly Weather Review*. They deal with a variety of subjects, including the meteorological conditions characteristic of different parts of cyclones and anticyclones in Europe and America during summer and winter. The temperature gradient at different levels receives special attention. The last four papers deal with a waterspout, or waterspouts, seen near Cottage City, Mass., in August, 1896. In most of the papers, even those relating to the waterspout, there is a rich profusion of statistical data, conversion factors, and mathematical formulæ. There are sixty-seven tables and forty illustrations, including ten full-page photographs of the Cottage City waterspout at different stages of development. A large number of conclusions are also drawn. The papers provide evidence of industry and imagination, and the conclusions and observational data will no doubt receive the critical examination of meteorologists.

A CORRESPONDENT has written to point out that Prof. von Thán, to whose memory a monument is to be erected at Ó-Becse, Hungary (see NATURE, August 27), held the chair of chemistry from 1862 in the University of Budapest, and not that of the University of Vienna.

OUR ASTRONOMICAL COLUMN.

DISCOVERY OF A COMET, 1908*c*.—A telegram received from the Kiel Centralstelle announces that a new comet was discovered by Prof. Morehouse, of the Drake University Observatory, Des Moines, Iowa (U.S.A.), on September 1. At 8h. 40m. (Yerkes M.T.) on that date the position of the comet was

R.A.=3h. 20m., dec.=66° 15′ N.,

and it was reported as moving rapidly in either a south-east or north-west direction. It was also said to possess a long, conspicuous tail.

A second telegram states that this object was observed by Prof. Thiele at Copenhagen on September 3, its position at 10h. 29·6m. (Copenhagen M.T.) being

R.A.=3h. 19m. 43s., dec.=67° 14′ 42″ N.,

so that the motion is north-west. This observation gave the magnitude of the comet as 9·0. The present apparent path lies through Cassiopeia towards Cepheus, and the comet does not set below the horizon in London; it reaches the zenith about 4 a.m., and should therefore be an easy object for telescopic observation.

The comet was quite easily found with a 3¼-inch equatorially-mounted finder at South Kensington on Friday night, September 4, and in the 10-inch refractor, with a power of 100, appeared as a very diffuse, nebulous patch with scarcely a trace of any stellar nucleus.

LARGE SUN-SPOTS.—The large sun-spots illustrated in these columns in our issue of August 13 have again appeared round the eastern limb of the sun. They were first re-observed at South Kensington on August 27, and have since been visible to the naked eye. On August 29 a new, large spot followed, and on September 1 the large group, two large single spots, and a smaller group were to be seen on the disc. For the actual epoch of solar activity the disc is, therefore, displaying a remarkable amount of spotted area.

RECENT METEORS.—Some interesting notes on meteors recently observed are published by Mr. Denning in No. 400 of the *Observatory* (p. 350, September). Mr. Denning remarks on the favourable conditions for meteor observations that obtained during the present summer, and states that on fifteen dates between July 18 and August 8 he observed 204 meteors during 20½ hours. Of these, more than half were traced to known radiants, forty-two of them being Perseids. During the period July 26 to August 7, the Perseid radiant moved from 25°, +53°, to 41°, +56°; a late Perseid was seen, on August 17 at 9h. 25m., which left a fine streak, and was directed from 51°, +58°; another, of the first magnitude, was seen on August 19d. 9h. 44m., and its direction was from a point at 56°, +60°.

For the period June 25 to August 10, Mr. Denning received duplicate observations of ten meteors, for which he gives the particulars of the real paths.

D_3 (HELIUM) ABSORPTION IN THE SOLAR SPECTRUM.—In a letter to the *Observatory* (No. 400, September, p. 353) Captain Daunt reports that he believes he observed D_3 dark in the solar spectrum when making visual spectroscopic observations of the large sun-spot group which was near the eastern limb on August 1. The line had much the same appearance as that shown on the photograph taken by Mr. Nagaraja at Kodaikánal last year, running as a fairly fine dark line, somewhat thickened in the centre, right across the group. Although the sun